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School Closure and Reopening During the COVID-19 Pandemic: A Scoping Review Protocol

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School Closure and Reopening During the COVID-19 Pandemic: A Scoping Review Protocol

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Abstract

Objective: The objective of this scoping review is to provide an overview of existing studies and evidence on the impact of K-12 school closure and reopening during the pandemic.

Introduction:

Widespread school closures in response to the COVID-19 pandemic have caused detrimental effects on the education, physical health, and mental well-being of children. Many children have been exposed to domestic violence, neglect, and isolation, with children of vulnerable backgrounds disproportionately affected. Opening school safely and strategically plays a critical role in protecting children's health and well-being, controlling SARS-CoV-2 community transmission, and re-establishing community life. An understanding of the impact of school closure and reopening as well as factors influencing school safety is critical to bring school operations back to normal. There is a paucity of research on individual knowledge, needs, and behaviors in the context of school reopening. In the proposed study, we will conduct a scoping review to systematically examine the impact of COVID-19 related school closure and reopening on K-12 schools.

Inclusion criteria:

Eligible studies/literatures include members of K-12 schools (students [age 4-18], parents, staff, faculty, COVID-19 coordinator, school nurses) in countries affected by the COVID-19 pandemic. For K-12 students, we will exclude university or college students. There will be no exclusion based on methods, timing, school operational status, or country. All concepts regarding school closure and reopening will be considered, and all types of research will be considered.

Methods:

This scoping review will follow JBI methodology for scoping reviews. Sources of evidence published from 2020 to present will be included. The search will include PubMed, preprints in EuropePMC, ERIC, Scopus, Web of Science Core Collection, Psycinfo, Embase, CINAHL. We will cover grey literature in the Harvard Think Tank Database and COVID-19 Evidence Hub. Multiple reviewers will independently screen searched articles to identify those that meet the inclusion criteria. We will utilize the matrix method for data extraction. Citation chaining and a critical appraisal will be performed.

Article Summary: Strengths and Limitations of this Study

- The proposed study is the first and only scoping review to thoroughly examine current studies on the impact of COVID-19-related K-12 school closures and reopens.
- The proposed scoping review lays the groundwork for future research directions into K-12 school safety during a respiratory viral pandemic.
- The findings and understandings from the proposed work will contribute significantly to keeping K-12 school members safe during a respiratory viral pandemic.
- The scoping review methodology will not allow us to directly assess safety strategies and make conclusion on safety interventions implemented in K-12 schools.
- A limitation of the proposed review is that we will utilize google translate to review articles that are not written in English, Chinese, French, or Spanish, as the researchers on the team lack fluency in other languages.

Introduction

The SARS-CoV-2 pandemic is the worst global respiratory viral emergency since the influenza pandemic of 1918-1919.^{1, 2} Schools worldwide closed due to absenteeism, to prevent disease transmission, and limit risk to vulnerable members of the school community. Due to the unique social dynamics of educational settings, in-person schooling increases the risk of viral transmission to more vulnerable individuals, particularly in lower-income areas where crowding is more likely.^{3, 4} Schools are a major concern for novel coronavirus transmission given the social dynamics among schoolchildren, crowding in institutional environments, and extracurricular events that may increase risk.⁵⁻⁸ Children and adolescents often have closer interactions with each other than adults and younger children may struggle to follow mask use and hand hygiene guidance.

School closures have had clear detrimental effects on student well-being.⁹⁻¹⁰⁻¹³ Children, especially those from vulnerable communities,^{3, 12, 14} are exposed to educational deficits, lack of resources, isolation, and domestic violence.^{5, 10, 11, 13, 15-18} A national poll shows that 4 out of 10 US teens have not used online learning portals since the pandemic began.¹⁹⁻²² Without access to customary channels of support, such as schools and doctor's offices, school shutdowns have made some children more vulnerable to abuse and neglect.¹⁰ In addition, working parents from all societal sectors are more likely to miss work due to

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added childcare burden during school closures.²³⁻²⁶ In-person schooling plays a vital role in the societal function and children’s well-being.

Local governments have prioritized school reopening given the large individual and societal costs of closures, particularly for students whose parents have essential jobs in healthcare, transportation, and other key societal services.^{5, 27} Controlling outbreaks among children is crucial to keeping schools open and protecting the well-being of the community at large.^{28, 29} To promote adherence to recommended COVID-19 prevention practices, adult supervision, student buy-in/engagement, and regular encouragement of safe personal behaviors are essential.³⁰

There are many factors that play a critical role in school safety during the pandemic. First, school members’ (students, teachers, staff, and parents) attitudes, perceptions, and knowledge will influence the practice of safety behaviors. Individual protective behaviors play an important role in limiting the spread of infectious diseases. These include preventive measures (such as hand hygiene, wearing face masks, and physical distancing) and illness management measures (such as medical consultation, testing, and infection control).³¹ Second, school-directed initiatives are also crucial to develop a safe environment. Some of the commonly practiced school-directed initiatives include engineering control, contact tracing, quarantine/isolation systems, scheduled disinfection, and occupancy control. Finally, school members deserve a definitive answer on the impact of school reopening status on viral transmission and school member’s physical and mental health.

Despite the importance of the topic, to date, there is no comprehensive review on school closure and reopening during the COVID-19 pandemic. In this scoping review, we will provide an overview of existing studies and evidence on the impact of school closure and reopening during the pandemic. We present research from or on K-12 schools, which include students, teachers, faculty, staff, parents, COVID-19 coordinators, K-12 school nurses (or other school clinic staff). We will include studies from any country that has been affected by the COVID-19 pandemic. We aim to identify contents and themes that have been researched and analyze the quality of the evidence. Our study will offer important insights into protecting youth and disease control in an institutional setting. Finally, we hope to guide future areas of research and recommend policies to support school safety during a pandemic.

Methods

Review Question/Objective

What is known about school closure and reopening during the COVID-19 pandemic? What methods have been used to explore this issue? What research questions have been covered in the current studies?

Inclusion Criteria

Types of Participants

Target participants for this review are school members in K-12 schools. Members include K-12 students, teachers, faculty, staff, parents, COVID-19 coordinators, K-12 school nurses (or other school clinic staff). We will exclude university and college students.

Concept

- 1) A summary of the topics that has been studied and published on school reopening;
- 2) What is the school's operation status on SARS-CoV-2 transmission?
- 3) The attitude and beliefs toward K-12 school reopening during the COVID-19 pandemic;
- 4) The general knowledge toward prevention strategies during K-12 school reopening;
- 5) The mental/emotional health concerns related to K-12 school reopening

Context

The context in this review includes all countries that have been affected by the COVID-19 pandemic.

Source of Evidence

In this review, the following databases will be searched for the year 2020 or 2021: PubMed, preprints in EuropePMC, ERIC, Scopus, Web of Science Core Collection, Psycinfo, Embase, CINAHL. We will cover grey literature in Harvard Think Tank Database, COVID-19 Evidence Hub like COVID-END), and Google Scholar. Through the data extraction process, we will identify key articles to perform citation chaining. Citation chaining to identify additional relevant publications will be conducted following the screening process.

Keywords and PUBMED/Scopus search strategy for literature on safe school reopening during the COVID-19 pandemic

("sars cov 2"[MeSH Terms] OR "sars cov 2"[All Fields] OR "covid"[All Fields] OR covid19[All Fields] OR "covid 19"[MeSH Terms] OR "covid 19"[All Fields] OR ("pandemic"[Title/Abstract] AND 2020:3000[pdat])) AND ((School[tw] OR schools[tw] OR schools[mh:noexp] OR return to school[mh] OR student[mh:noexp] OR student*[tw] OR teacher*[tw] OR school teachers[mh] OR educational personnel[mh:noexp] OR kindergarten*[tw] OR schoolchildren[tw]) NOT (Schools, health occupations[mh] OR universities[mh] OR college*[tw]))

(TITLE-ABS-KEY (school* OR student* OR teacher* OR kindergarten* OR "educational personnel") AND NOT TITLE-ABS-KEY (college* OR universit* OR "medical school*" OR "nursing school*" OR "dental school*")) AND (TITLE-ABS-KEY (covid OR covid19 OR covid-19 OR "sars cov 2" OR pandemic)) AND (LIMIT-TO (PUBYEAR , 2021) OR LIMIT-TO (PUBYEAR , 2020))

Data Chart Template

Study Reference (Author, Title, Journal)
Article Type

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Country
Purpose
Study Methods/Design
Impact of school reopen status on transmission
Knowledge, Attitude, and Behaviors of school closure and reopen during COVID-19
Parent belief/concerns
Teacher belief/concerns
Parent mental health
Teacher mental health
Student mental health
Concept
Outcome/Finding
Nurse/COVID-19 coordinator
Society
Gaps in Research
Funder
Profession of the authors
School type

Extracting and Charting the Results

The PRISMA flowchart will be used to visualize the numerical outputs from scoping reviews and the inclusion decision process. In our flowchart, we'll clearly illustrate the process for finding studies, removing duplicates, selecting the right articles, retrieving the full article from the library, and presenting the final analysis. In a scoping review, ‘charting the results’ is an iterative process that involves the extraction of relevant data from all the studies included in the review. We developed a charting template to facilitate the extraction of data across reviewers regarding characteristics of articles included in our review and key details pertinent to our objectives. The form will be refined (or consolidated) once a sample of studies has been charted independently by two or more reviewers. Both quantitative and qualitative data are expected to be included in the results of the review. These findings will be presented in the form of narratives and visuals, such as evidence maps and tabular presentations.

Assessment of Methodological Quality

PRISMA-ScR does not mandate scoping reviews to assess the methodological quality of evidence identified through literature search. To provide a structured and detailed method of critically analyzing the characteristics of the evidence, it was decided that an assessment of methodological quality would be incorporated into the proposed scoping review. Critical appraisal of the methodological quality of all relevant studies will be assessed using the JBI critical appraisal tools.³² The results of the critical appraisal will be presented in the results section.

Protocol Registration

This protocol cannot be registered in the Prospective Register of Systematic Reviews (PROSPERO) because this registry is not for scoping reviews. We will register it in OSF Registration.

The paper will appear in a peer-reviewed, open-access journal to ensure a broad dissemination. The review will be based on published works and grey literature, thus it is exempt from formal ethical approval.

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The study was conceived by DL, SHV, KN, and MAB. The protocol was first drafted by DL and KN. The manuscript has been revised by KN, DL, XZ, DC, SHV, and MAB for important intellectual content.

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Disclaimer

There was no involvement of the funders in the design and writing of the protocol or in the decision to submit it for publication.

Competing Interests

None declared.

Patient and Public Involvement

There was no involvement of the community or patients in the designing, conducting, or reporting of this research.

Provenance and Peer Review

Not commissioned; externally peer-reviewed.

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School Closures and Reopenings During the COVID-19 Pandemic: A Scoping Review Protocol

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School Closures and Reopenings During the COVID-19 Pandemic: A Scoping Review Protocol

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Abstract

Objective: The objective of this scoping review is to provide an overview of existing studies and evidence on the impact of school closures and reopenings during the pandemic.

Introduction:
The COVID-19 pandemic has necessitated widespread school closures, and reopening schools safely has a pivotal role in the well-being of children and teachers, SARS-CoV-2 transmission control, and optimal societal functioning. Widespread school closures in response to the COVID-19 pandemic have caused adverse effects on the education, physical health, and mental well-being of children. An understanding of the impact of school closures and reopenings as well as factors influencing school safety is critical to bringing schools' operational status back to normal. Despite the implication of individual concerns and knowledge on disease prevention practices, there is a paucity of research on individual knowledge, needs, and behaviors in the context of school reopenings. In the proposed study, we will conduct a scoping review to identify and inventory the current research and evidence on the impact of COVID-19 on K-12 schools (primary and secondary schools and vice versa).

Methods and Analysis:
Eligible studies/literatures include members of K-12 (primary and secondary) schools (students, parents, staff, faculty, COVID-19 coordinator, school nurses) in countries affected by the COVID-19 pandemic. We will exclude university or college students. There will be no exclusion based on methods, timing, or school operational status. All concepts regarding school closures and reopenings will be considered, and all types of research will be considered.

This scoping review will follow JBI methodology for scoping reviews. Sources of evidence published from 2020 to October 31st, 2021 will be included. The search will include PubMed, preprints in EuropePMC, ERIC, Scopus, Web of Science Core Collection, Psycinfo, Embase, CINAHL, VHL. We will cover grey literature in Harvard Think Tank Database, COVID-19 Evidence Hub like COVID-END, and Google Scholar. The abstract and title screening, full-text screening, and data extraction will be done by two independent reviewers. Disagreements will be resolved by an independent third reviewer. Data extract will be done on Qualtrics form to ensure accurate extraction. Citation chaining will be performed on key articles identified. A critical appraisal will be performed.

The scope review will take place from August 1st, 2021 to November 15th, 2021. On October 31st, we will perform a final round of updated search and citation chaining.

Ethics and Dissemination

The review will be based on published works and grey literature, thus it is exempt from formal ethical approval. This protocol cannot be registered in the Prospective Register of Systematic Reviews (PROSPERO) because this registry is not for scoping reviews. We will register it in OSF Registration. The paper will appear in a peer-reviewed, open-access journal to ensure a broad dissemination.

Strength and Limitations

- The proposed study is the first and only scoping review to thoroughly inventory current studies on the impact of COVID-19-related K-12 schools (primary and secondary schools) closures and reopenings.
- The proposed scoping review lays the groundwork for future research directions into K-12 schools (primary and secondary schools) safety during a respiratory viral pandemic.
- The scoping review methodology will not allow us to directly assess safety strategies and make conclusions on safety interventions
- A limitation of the proposed review is that we will utilize translating software to review articles that are not written in English.
- We rely on the subject index and English titles and abstracts to retrieve foreign language papers.

Introduction

The SARS-CoV-2 pandemic is the worst global respiratory viral emergency since the influenza pandemic of 1918-1919.^{1, 2} Schools worldwide were forced to close due to absenteeism, prevent disease transmission, and limit risk to vulnerable members of the school community. Due to the unique social dynamics of educational settings, in-person schooling increases the risk of viral transmission to more vulnerable individuals, particularly in lower-income areas where crowding is more likely.^{3, 4} Schools are a major concern for novel coronavirus transmission given the social dynamics among schoolchildren, crowding in institutional environments, and

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extracurricular events that may increase risk.^{5, 6} Children and adolescents often have closer interactions with each other than adults and younger children may struggle to follow mask use and hand hygiene guidance. To promote adherence to recommended COVID-19 prevention practices, adult supervision, student buy-in/engagement, and regular encouragement of safe personal behaviors are essential.

In-person school plays a vital role in the societal function and children’s well-being. School closures have had clear detrimental effects on student well-being.⁷⁻¹¹ Children, especially those from vulnerable communities,^{3, 10} are exposed to educational deficits, lack of resources, isolation, and domestic violence.^{5, 7-9, 11-15} According to a national survey, 4 out of 10 US teens did not use online learning portals during the first semester following the start of the pandemic.¹⁶⁻¹⁹ Without access to customary channels of support, such as schools and doctor’s offices, school shutdowns have made some children more vulnerable to abuse and neglect.⁸ In addition, working parents from all societal sectors are more likely to miss work due to added childcare burden during school closures.²⁰⁻²² As a result, local governments have prioritized school reopenings given the large individual and societal costs of closures, particularly for students whose parents have essential jobs in healthcare, transportation, and other key societal services.⁵ Controlling outbreaks among children is crucial to keeping schools open and protecting the well-being of the community at large.^{23, 24} Many secondary teachers reported concerns about both environmental safety and student well-being.²⁵ There are many factors that play a critical role in school safety during the pandemic. First of all, school members’ (students, teachers, staff, and parents) attitude, perception, and knowledge will influence the practice of safety behaviors. Individual protective behaviors play an important role in limiting the spread of infectious diseases. These include preventive measures (such as hand hygiene, wearing face masks, and physical distancing) and illness management measures (such as medical consultation, testing, and infection control).²⁶ Second, school-directed initiatives are also crucial to develop a safe environment. Some of the commonly practiced school-directed initiatives include engineering control, contact tracing, quarantine/isolation systems, scheduled disinfection, and occupancy control. Finally, school members deserve a definitive answer on the impact of school reopening status on viral transmission and school member’s physical and mental health.

Despite the importance of the topic, to date, there is no comprehensive review that inventories the impact of COVID-19 on K-12 schools (primary and secondary schools) and vice versa. In this scoping review, we will provide an overview of existing studies and evidence on the impact of school closures and reopenings during the pandemic. We present research from or on K-12 schools (primary and secondary schools), which include students, teachers, faculty, staff, parents, COVID-19 coordinators, school nurses (or other school clinic staff). We will include studies from any country that has been affected by the COVID-19 pandemic. The purpose of this study is to identify the contents and themes that have been researched, and to analyze the quality of evidence. The goal of the scoping review is to identify and analyze the existing knowledge gaps regarding school reopenings and safety during a viral respiratory pandemic and to serve as a precursor to future research in this field. Finally, we hope to guide future areas of research and recommend policies to support school safety during a pandemic.

Methods

Review Question/Objective

What is known about school closures and reopenings during the COVID-19 pandemic? What research questions and themes have been covered in the current studies? What methods have been used to explore this issue? What types of studies have been done on investigating the impact of COVID-19 on school members' physical and mental health? What are the knowledge gaps in the impact of COVID-19 on primary and secondary schools and school members?

Inclusion Criteria

Types of Participants

Target participants for this review are school members in K-12 schools (primary and secondary schools). Members include students, teachers, faculty, staff, parents, COVID-19 coordinators, school nurses (or other school clinic staff). (We will exclude university and college students.

Concept

- 1) A summary of the topics that has been studied and published on school reopenings;
- 2) The types of research studies and publications on primary and secondary schools and COVID-19
- 3) Knowledge gaps regarding the impact of COVID-19 on primary and secondary schools and school members
- 4) The general knowledge toward prevention strategies during K-12 school (primary and secondary schools) reopenings;
- 5) Key concepts and definition regarding, attitudes and beliefs toward, and the physical/mental/emotional health concerns related to K-12 school (primary and secondary schools) reopenings during a respiratory viral pandemic

Context

The context in this review includes all countries that have been affected by the COVID-19 pandemic.

Source of Evidence

In this review, the following databases will be searched for the year 2020 or 2021: PubMed, preprints in EuropePMC, ERIC, Scopus, Web of Science Core Collection, Psycinfo, Embase, CINAHL, VHL. We will cover grey literature in Harvard Think Tank Database, COVID-19 Evidence Hub like COVID-END), and Google Scholar.

Through the data extraction process, we will identify key articles to perform citation chaining. Citation chaining to identify additional relevant publications will be conducted following the screening process.

Keywords and PUBMED/Scopus search strategy for literature on safe school reopenings during the COVID-19 pandemic

("sars cov 2"[MeSH Terms] OR "sars cov 2"[All Fields] OR "covid"[All Fields] OR covid19[All Fields] OR "covid 19"[MeSH Terms] OR "covid 19"[All Fields] OR ("pandemic"[Title/Abstract] AND 2020:3000[pdat])) AND ((School[tw] OR schools[tw] OR schools[mh:noexp] OR return to school[mh] OR student[mh:noexp] OR student*[tw] OR teacher*[tw] OR school teachers[mh] OR educational personnel[mh:noexp] OR kindergarten*[tw] OR schoolchildren[tw]) NOT (Schools, health occupations[mh] OR universities[mh] OR college*[tw]))

(TITLE-ABS-KEY (school* OR student* OR teacher* OR kindergarten* OR "educational personnel") AND NOT TITLE-ABS-KEY (college* OR university* OR "medical school*" OR "nursing school*" OR "dental school*")) AND (TITLE-ABS-KEY (covid OR covid19 OR covid-19 OR "sars cov 2" OR pandemic)) AND (LIMIT-TO (PUBYEAR , 2021) OR LIMIT-TO (PUBYEAR , 2020))

We will conduct two rounds of screening. Two independent reviewers will screen the title and abstract, as well as the full text of the manuscript retrieved by our search strategy. Conflicts will be resolved by a third reviewer.

Extracting and Charting the Results

The PRISMA flow chart will be used to visualize the numerical outputs from scoping reviews and the inclusion decision process. In our flowchart, we'll clearly illustrate the process for finding studies, removing duplicates, selecting the right research, retrieving the full article from the library, and presenting the final analysis. To assist us in processing foreign language manuscripts, Google Translator and DeepL will be used. In scoping review, 'charting the results' is an iterative process that involves the extraction of relevant data from all the studies included in the review. We developed a charting template (Table 1) to facilitate the extraction of data across reviewers regarding characteristics of articles included in our review and key details pertinent to our objectives. The form (Table 1) will be refined (or consolidated) once a sample of studies has been charted independently by two or more reviewers. Both quantitative and qualitative data are expected to be included in the results of the review. These findings will be presented in the form of narratives and visuals, such as evidence 'maps' and tabular presentations.

In order to address the objective of the paper, the following data will be extracted: First Author; Title; Journal; Year of Publication; Type of Publication; Academic Discipline; Profession of the Authors; Sample Size; Study Objective; Author's Main Conclusion; Funder; Method and Design; Country; School Type; Participant Age; Roles in School; School Status; Duration; Viral Strains; Safety Protocols;

Transmission; Physical Health; Educational Outcomes; Mental Health; Social Outcomes; Attitudes/Beliefs; Behaviors; Gaps in Research (Table 1). Extraction instructions are detailed in Table 1.

Assessment of Methodological Quality

PRISMA-ScR does not mandate scoping reviews to assess the methodological quality of evidence identified through literature search. To provide a structured and detailed method of critically analyzing the characteristics of the evidence, it was decided that an assessment of methodological quality would be incorporated into the proposed scoping review. Critical appraisal of the methodological quality of all relevant studies will be assessed using the JBI critical appraisal tools.²⁷ Two independent reviewers will conduct the critical appraisal. A third independent reviewer will evaluate disagreements. All foreign language manuscripts will be translated using Google Translator and DeepL, and then a critical appraisal will be conducted.

The results of the critical appraisal will be presented in the results section.

Ethics and Disseminations

The study is not subject to ethics approval since it is based on published works. This protocol cannot be registered in the Prospective Register of Systematic Reviews (PROSPERO), since this registry is not intended for scoping reviews. It has been registered with OSF Registration. The article will be published in a peer-reviewed, open-access journal to ensure wide distribution.

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Contributor

The study was conceived by DL, SHV, KN, and MAB. The protocol was first drafted by DL and KN. The manuscript has been revised by KN, DL, YZ, XZ, DC, SHV, and MAB for important intellectual content.

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Disclaimer

There was no involvement of the funders in the design and writing of the protocol or in the decision to submit it for publication.

Competing Interests

None declared.

Patient and Public Involvement

There was no involvement of the community or patients in the designing, conducting, or reporting of this research.

Provenance and Peer Review

Not commissioned; externally peer-reviewed.

Open Access

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Domain	Extracted Information	BMJ Open Explanation
Study Characteristics	First Author	Copy and Paste First Author's Last Name
	Title	Copy and Paste the Title
	Journal	Copy and Paste the Title
	Year of Publication	Number Only
	Type of Publication	Journal Article, Letter, Editorial, Opinion, News, Case Reports, Reviews, Guidelines, Protocols
	Academic Discipline	Education, Public Health, Medicine, Government Agent
	Profession of the Authors	Reviewer Summarize
	Sample Size	Number Only
	Study Objective	Copy and Paste Study Objective from the Manuscript (<5 sentences)
	Author's Main Conclusion	Copy and Paste Main Conclusion (<5 sentences)
Population Characteristics	Funder	Copy and Paste Funding Source
	Method and Design	Reviewer read full-text and summarize method and design
	Country	Copy and Paste from the Manuscript
	School Type	Reviewer Summarize. Examples: public vs. private, day vs. boarding, special education

Table 1. Data Extraction Chart

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	Participant Age	Reviewer Summarize
		Reviewer Summarize. Examples: public vs. private, day vs. boarding, special education
	Roles in School	
		Open, Closed, Remote, Hybrid Model. Reviewers read full text and summarize.
	School Status	
	Duration	Reviewer Summarize
Key Themes/ Outcomes	Viral Strains	Reviewer read full-text and extract information.
		Reviewer Summarize. Definition and Conclusions. Examples: Testing, Mask, Physical Distance, Ventilation, Hand Hygiene, etc.
	Safety Protocols	
	Transmission	Definitions; Themes; Conclusions
	Physical Health	Definitions; Themes; Conclusions
	Educational Outcomes	Definitions; Themes; Conclusions
	Mental Health	Definitions; Themes; Conclusions
	Social Outcomes	Definitions; Themes; Conclusions
	Attitudes/Beliefs	Definitions; Themes; Conclusions
	Behaviors	Definitions; Themes; Conclusions
	Gaps in Research	Themes; Summary

BMJ Open

School Closures and Reopenings During the COVID-19 Pandemic: A Scoping Review Protocol

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Keywords:	COVID-19, Community child health < PAEDIATRICS, Child protection < PAEDIATRICS, EDUCATION & TRAINING (see Medical Education & Training), EPIDEMIOLOGY, INFECTIOUS DISEASES

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School Closures and Reopenings During the COVID-19 Pandemic: A Scoping Review Protocol

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Abstract

Objective: The objective of this scoping review is to provide an overview of existing studies and evidence on the impact of school closures and reopenings during the pandemic.

Introduction:

The COVID-19 pandemic has necessitated widespread school closures, and reopening schools safely has a pivotal role in the well-being of children and teachers, SARS-CoV-2 transmission control, and optimal societal functioning. Widespread school closures in response to the COVID-19 pandemic have caused adverse effects on the education, physical health, and mental well-being of children. An understanding of the impact of school closures and reopenings as well as factors influencing school safety is critical to bringing schools' operational status back to normal. Despite the implication of individual concerns and knowledge on disease prevention practices, there is a paucity of research on individual knowledge, needs, and behaviors in the context of school reopenings. In the proposed study, we will conduct a scoping review to identify and inventory the current research and evidence on the impact of COVID-19 on K-12 schools (primary and secondary schools and vice versa).

Methods and Analysis:

Eligible studies/literatures include members of K-12 (primary and secondary) schools (students, parents, staff, faculty, COVID-19 coordinator, school nurses) in countries affected by the COVID-19 pandemic. We will exclude university or college students. There will be no exclusion based on methods, timing, or school operational status. All concepts regarding school closures and reopenings will be considered, and all types of research will be considered.

This scoping review will follow Joanna Briggs Institute (JBI) methodology for scoping reviews. Sources of evidence published from 2020 to October 31, 2021 will be included. The search will include PubMed, preprints in EuropePMC, ERIC, Scopus, Web of Science Core Collection, Psycinfo, Embase, CINAHL, VHL. We will cover grey literature in Harvard Think Tank Database, COVID-19 Evidence Hub like COVID-END, and Google Scholar. The abstract and title screening, full-text screening, and data extraction will be done by two independent reviewers. Disagreements will be resolved by an independent third reviewer. Data extract will be done on Qualtrics form to ensure accurate extraction. Citation chaining will be performed on key articles identified. A critical appraisal will be performed.

The scope review will take place from August 1, 2021 to November 15, 2021. We will perform a final round of updated search and citation chaining.

Ethics and Dissemination

The review will be based on published works and grey literature, thus it is exempt from formal ethical approval. This protocol cannot be registered in the Prospective Register of Systematic Reviews (PROSPERO) because this registry is not for scoping reviews. We will register it in OSF Registration. The paper will appear in a peer-reviewed, open-access journal to ensure a broad dissemination.

Strengths and Limitations

Strengths

- The proposed study is the first and only scoping review to thoroughly inventory current studies on the impact of COVID-19-related K-12 schools (primary and secondary schools) closures and reopenings.
- The scoping review is reviewing literature from a comprehensive set of databases and grey literature hubs. A strength of the proposed review is that the author group can read at least 3 languages and we also will utilize translating software to review articles that are not written in English.

Limitations

- The scoping review methodology will not allow us to directly assess safety strategies and make conclusions on safety interventions
- We rely on the subject index and English titles and abstracts to retrieve foreign language papers.

Introduction

The SARS-CoV-2 pandemic is the worst global respiratory viral emergency since the influenza pandemic of 1918-1919.^{1, 2} Schools worldwide were forced to close due to absenteeism, prevent disease transmission, and limit risk to vulnerable members of the school community. Due to the unique social dynamics of educational settings, in-person schooling increases the risk of viral transmission to more vulnerable individuals, particularly in lower-income areas where crowding is more likely.^{3, 4} Schools are a major concern for novel coronavirus transmission given the

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social dynamics among schoolchildren, crowding in institutional environments, and extracurricular events that may increase risk.^{5, 6} Children and adolescents often have closer interactions with each other than adults and younger children may struggle to follow mask use and hand hygiene guidance. To promote adherence to recommended COVID-19 prevention practices, adult supervision, student buy-in/engagement, and regular encouragement of safe personal behaviors are essential.

In-person school plays a vital role in the societal function and children’s well-being. School closures have had clear detrimental effects on student well-being.⁷⁻¹¹ Children, especially those from vulnerable communities,^{3, 10} are exposed to educational deficits, lack of resources, isolation, and domestic violence.^{5, 7-9, 11-15} According to a national survey, 4 out of 10 US teens did not use online learning portals during the first semester following the start of the pandemic.¹⁶⁻¹⁹ Without access to customary channels of support, such as schools and doctor’s offices, school shutdowns have made some children more vulnerable to abuse and neglect.⁸ In addition, working parents from all societal sectors are more likely to miss work due to added childcare burden during school closures.²⁰⁻²² As a result, local governments have prioritized school reopenings given the large individual and societal costs of closures, particularly for students whose parents have essential jobs in healthcare, transportation, and other key societal services.⁵ Controlling outbreaks among children is crucial to keeping schools open and protecting the well-being of the community at large.^{23, 24} Many secondary teachers reported concerns about both environmental safety and student well-being.²⁵ There are many factors that play a critical role in school safety during the pandemic. First of all, school members’ (students, teachers, staff, and parents) attitudes, perceptions, and knowledge will influence the practice of safety behaviors. Individual protective behaviors play an important role in limiting the spread of infectious diseases. These include preventive measures (such as hand hygiene, wearing face masks, and physical distancing) and illness management measures (such as medical consultation, testing, and infection control).²⁶ Second, school-directed initiatives are also crucial to develop a safe environment. Some of the commonly practiced school-directed initiatives include engineering control, contact tracing, quarantine/isolation systems, scheduled disinfection, and occupancy control. Finally, school members deserve a definitive answer on the impact of school reopening status on viral transmission and school member’s physical and mental health.

Despite the importance of the topic, to date, there is no comprehensive review that inventories the impact of COVID-19 on K-12 schools (primary and secondary schools) and vice versa. In this scoping review, we will provide an overview of existing studies and evidence on the impact of school closures and reopenings during the pandemic. We present research from or on K-12 schools (primary and secondary schools), which include students, teachers, faculty, staff, parents, COVID-19 coordinators, school nurses (or other school clinic staff). We will include studies from any country that has been affected by the COVID-19 pandemic. The purpose of this study is to identify the contents and themes that have been researched, and to analyze the quality of evidence. The goal of the scoping review is to identify and analyze the existing knowledge gaps regarding school reopenings and safety during a viral respiratory pandemic and to serve as a precursor to future research in this field. Finally, we hope to guide future areas of research and recommend policies to support school safety during a pandemic.

Methods

Review Question/Objective

What is known about school closures and reopenings during the COVID-19 pandemic? What research questions and themes have been covered in the current studies? What methods have been used to explore this issue? What types of studies have been done on investigating the impact of COVID-19 on school members' physical and mental health? What are the knowledge gaps in the impact of COVID-19 on primary and secondary schools and school members?

Inclusion Criteria

Types of Participants

Target participants for this review are school members in K-12 schools (primary and secondary schools). Members include students, teachers, faculty, staff, parents, COVID-19 coordinators, school nurses (or other school clinic staff). Concept

- 1) A summary of the topics that have been studied and published on school reopenings;
- 2) The types of research studies and publications on primary and secondary schools and COVID-19
- 3) Knowledge gaps regarding the impact of COVID-19 on primary and secondary schools and school members

Context

The context in this review includes all countries that have been affected by the COVID-19 pandemic.

Source of Evidence

In this review, the following databases will be searched for the year 2020 or 2021: PubMed, preprints in EuropePMC, ERIC, Scopus, Web of Science Core Collection, Psycinfo, Embase, CINAHL, VHL. We will cover grey literature in Harvard Think Tank Database, COVID-19 Evidence Hub like COVID-END), and Google Scholar. Through the data extraction process, we will identify key articles to perform citation chaining. Citation chaining to identify additional relevant publications will be conducted following the screening process.

Keywords and PUBMED/Scopus search strategy for literature on safe school reopenings during the COVID-19 pandemic

("sars cov 2"[MeSH Terms] OR "sars cov 2"[All Fields] OR "covid"[All Fields] OR covid19[All Fields] OR "covid 19"[MeSH Terms] OR "covid 19"[All Fields] OR ("pandemic"[Title/Abstract] AND 2020:3000[pdat])) AND ((School[tw] OR schools[tw] OR schools[mh:noexp] OR return to school[mh] OR student[mh:noexp] OR student*[tw] OR teacher*[tw] OR school teachers[mh] OR educational personnel[mh:noexp] OR kindergarten*[tw] OR schoolchildren[tw]) NOT (Schools, health occupations[mh] OR universities[mh] OR college*[tw]))

(TITLE-ABS-KEY (school* OR student* OR teacher* OR kindergarten* OR "educational personnel") AND NOT TITLE-ABS-KEY (college* OR university* OR "medical school*" OR "nursing school*" OR "dental school*")) AND (TITLE-ABS-KEY (covid OR covid19 OR covid-19 OR "sars cov 2" OR pandemic)) AND (LIMIT-TO (PUBYEAR , 2021) OR LIMIT-TO (PUBYEAR , 2020))

We will conduct two rounds of screening. Two independent reviewers will screen the title and abstract, as well as the full text of the manuscript retrieved by our search strategy. Conflicts will be resolved by a third reviewer.

Extracting and Charting the Results

The PRISMA flow chart will be used to visualize the numerical outputs from scoping reviews and the inclusion decision process. In our flowchart, we'll clearly illustrate the process for finding studies, removing duplicates, selecting the right research, retrieving the full article from the library, and presenting the final analysis. To assist us in processing foreign language manuscripts, Google Translator and DeepL will be used. In scoping review, 'charting the results' is an iterative process that involves the extraction of relevant data from all the studies included in the review. In order to address the issue of spin, we'll have the data extractors read key metaresearch articles about spin (in both intervention and observational studies) to "prime" them to be aware of common spin that may be present in included articles.^{27, 28} We developed a charting template to facilitate the extraction of data across reviewers regarding characteristics of articles included in our review and key details pertinent to our objectives. The form will be refined (or consolidated) once a sample of studies has been charted independently by two or more reviewers. Both quantitative and qualitative data are expected to be included in the results of the review. These findings will be presented in the form of narratives and visuals, such as evidence 'maps' and tabular presentations.

In order to address the objective of the paper, the following data will be extracted: First Author; Title; Journal; Year of Publication; Type of Publication; Academic Discipline; Field and Profession of the Authors; Sample Size; Study Objective; Author's Main Conclusion; Funder; Conflict of Interest. Method and Design; Country; School Type; Participant Age; Roles in School; School Status; Duration/Start and End Day; Viral Strains; Safety Protocols; Transmission; Physical Health; Educational Outcomes; Mental Health; Social Outcomes; Attitudes/Beliefs; Behaviors; Gaps in Research. Extraction instructions are detailed in the Data Extraction Chart (Table 1).

Assessment of Methodological Quality

PRISMA-ScR does not mandate scoping reviews to assess the methodological quality of evidence identified through literature search. To provide a structured and detailed method of critically analyzing the characteristics of the evidence, it was decided that an assessment of methodological quality would be incorporated into the proposed scoping review. Critical appraisal of the methodological quality of all relevant studies will be assessed using the JBI critical appraisal tools.²⁹ Two independent reviewers will conduct the critical appraisal. A third independent reviewer will evaluate disagreements. All foreign language manuscripts will be translated using Google Translator and DeepL, and then a critical appraisal will be conducted.

The results of the critical appraisal will be presented in the results section.

Ethics and Disseminations

The study is not subject to ethics approval since it is based on published works. This protocol cannot be registered in the Prospective Register of Systematic Reviews (PROSPERO), since this registry is not intended for scoping reviews. It has been registered with OSF Registration. The article will be published in a peer-reviewed, open-access journal to ensure wide distribution.

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The study was conceived by DL, SHV, KN, and MAB. The protocol was first drafted by DL and KN. The manuscript has been revised by KN, DL, YZ, XZ, DC, SHV, and MAB for important intellectual content.

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Disclaimer

There was no involvement of the funders in the design and writing of the protocol or in the decision to submit it for publication.

Competing Interests

None declared.

Patient and Public Involvement

There was no involvement of the community or patients in the designing, conducting, or reporting of this research.

Provenance and Peer Review

Not commissioned; externally peer-reviewed.

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Table 1. Data Extraction Chart

Domain	Extracted Information	Explanation
Study Char.	First Author	Copy and Paste First Author's Last Name
	Title	Copy and Paste the Title
	Journal	Copy and Paste the Title
	Year of Publication	Number Only
	Type of Publication	Journal Article, Letter, Editorial, Opinion, News, Case Reports, Reviews, Guidelines, Protocols
	Academic	Education, Public Health, Medicine, Government
	Field and	Reviewer Summarize
	Sample Size	Number Only
	Study Objective	Copy and Paste Study Objective from the
	Author's Main	Copy and Paste Main Conclusion (<5 sentences)
	Funder	Copy and Paste Funding Source
	Conflicts of interest	If available, then copy and paste conflicts of interest.
	Method and Design	Reviewer read full-text and summarize method and design
	Country	Copy and Paste from the Manuscript
Population Characteristics	School Type	Reviewer Summarize. Examples: public vs. private, day vs. boarding, special education
	Participant Age	Reviewer Summarize
	Roles in School	Reviewer Summarize.
	School Status	Open, Closed, Remote, Hybrid Model. Reviewers read full text and summarize.
	Duration/Start and	Reviewer Summarize
Key Themes/Outcomes	Viral Strains	Reviewer read full-text and extract information.
	Safety Protocols	Reviewer Summarize. Definition and Conclusions.
	Transmission	Definitions; Themes; Conclusions
	Physical Health	Definitions; Themes; Conclusions

	Educational	Definitions; Themes; Conclusions
	Mental Health	Definitions; Themes; Conclusions
	Social Outcomes	Definitions; Themes; Conclusions
	Attitudes/Beliefs	Definitions; Themes; Conclusions
	Behaviors	Definitions; Themes; Conclusions
	Gaps in Research	Themes; Summary

For peer review only